US010397341B2

(12) **United States Patent**
Schneider et al.

(10) **Patent No.: US 10,397,341 B2**
(45) **Date of Patent: *Aug. 27, 2019**

(54) **METHOD AND APPARATUS FOR MIGRATING ACTIVE COMMUNICATION SESSION BETWEEN TERMINALS**

(71) Applicant: **AT&T Intellectual Property I, L.P.**, Atlanta, GA (US)

(72) Inventors: **Marco Schneider**, Austin, TX (US); **Yi Zhang**, Austin, TX (US)

(73) Assignee: **AT&T Intellectual Property I, L.P.**, Atlanta, GA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/045,042**

(22) Filed: **Jul. 25, 2018**

(65) **Prior Publication Data**

US 2018/0332123 A1 Nov. 15, 2018

Related U.S. Application Data

(63) Continuation of application No. 15/666,029, filed on Aug. 1, 2017, now Pat. No. 10,064,031, which is a (Continued)

(51) **Int. Cl.**
H04M 3/56 (2006.01)
H04M 3/58 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04L 67/148*** (2013.01); ***H04L 29/06027*** (2013.01); ***H04L 29/06414*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04L 29/06027; H04L 29/06414; H04L 65/1006; H04L 65/1009; H04L 65/1043;
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,735,288 B1 5/2004 Geen et al.
6,788,660 B1 * 9/2004 Agrawal H04L 29/06027 370/331
(Continued)

FOREIGN PATENT DOCUMENTS

WO 9859508 A1 12/1998
WO 9959353 A1 11/1999

OTHER PUBLICATIONS

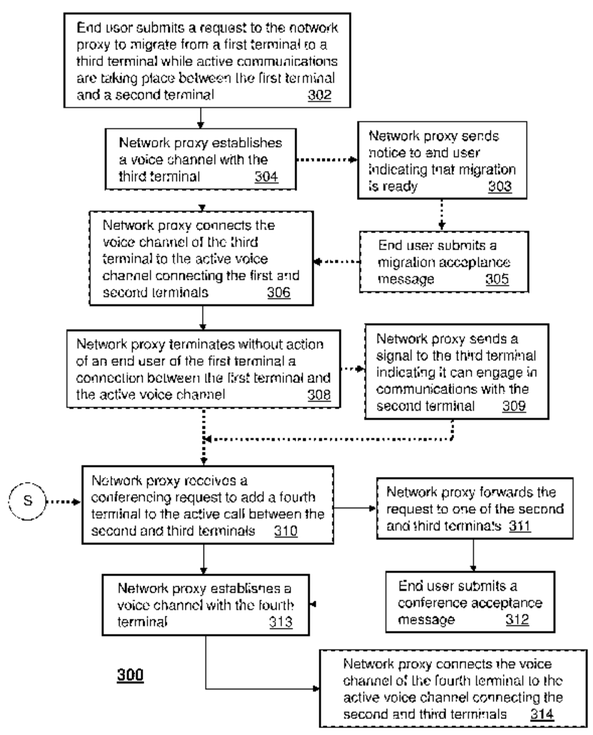
Ohta, Ken et al., "Adaptive Terminal Middleware for Session Mobility", Multimedia Signal Processing, 2002 IEEE Workshop on Dec. 9-11, 2002, Piscataway, NJ, USA, IEEE, May 19, 2003, 394-399.
(Continued)

Primary Examiner — Asad M Nawaz
Assistant Examiner — Kai Chang
(74) *Attorney, Agent, or Firm* — Guntin & Gust, PLC; Robert Gingher

(57) **ABSTRACT**

An apparatus and method are disclosed for migrating between terminals. An apparatus that incorporates teachings of the present disclosure may include, for example, a network proxy having a controller that manages a communications interface in a communication system. The controller can be programmed to receive a request to migrate a first terminal to a third terminal while active communications are taking place on a first voice channel connecting the first terminal to a second terminal, establish a second voice channel with the third terminal, connect the first and second voice channels, and terminate without action of an end user of the first terminal a connection between the first terminal and the first voice channel. Additional embodiments are disclosed.

20 Claims, 3 Drawing Sheets



Related U.S. Application Data

continuation of application No. 15/358,194, filed on Nov. 22, 2016, now Pat. No. 9,756,137, which is a continuation of application No. 11/420,181, filed on May 24, 2006, now Pat. No. 9,537,704.

(51) **Int. Cl.**

H04W 4/16	(2009.01)
H04L 29/06	(2006.01)
H04L 29/08	(2006.01)
H04W 68/00	(2009.01)

(52) **U.S. Cl.**

CPC ***H04L 65/1083*** (2013.01); ***H04L 65/403*** (2013.01); ***H04M 3/58*** (2013.01); ***H04W 4/16*** (2013.01); ***H04W 68/00*** (2013.01); *H04L 65/1006* (2013.01); *H04L 65/1009* (2013.01); *H04L 65/1043* (2013.01); *H04L 65/80* (2013.01); *H04L 67/14* (2013.01); *H04M 3/567* (2013.01); *H04M 2207/20* (2013.01); *H04Q 2213/1327* (2013.01)

(58) **Field of Classification Search**

CPC ... H04L 65/1083; H04L 65/403; H04L 65/80; H04L 67/14; H04L 67/148; H04M 3/567; H04M 3/58; H04M 2207/20; H04Q 2213/1327; H04W 4/16; H04W 68/00

See application file for complete search history.

(56) **References Cited**

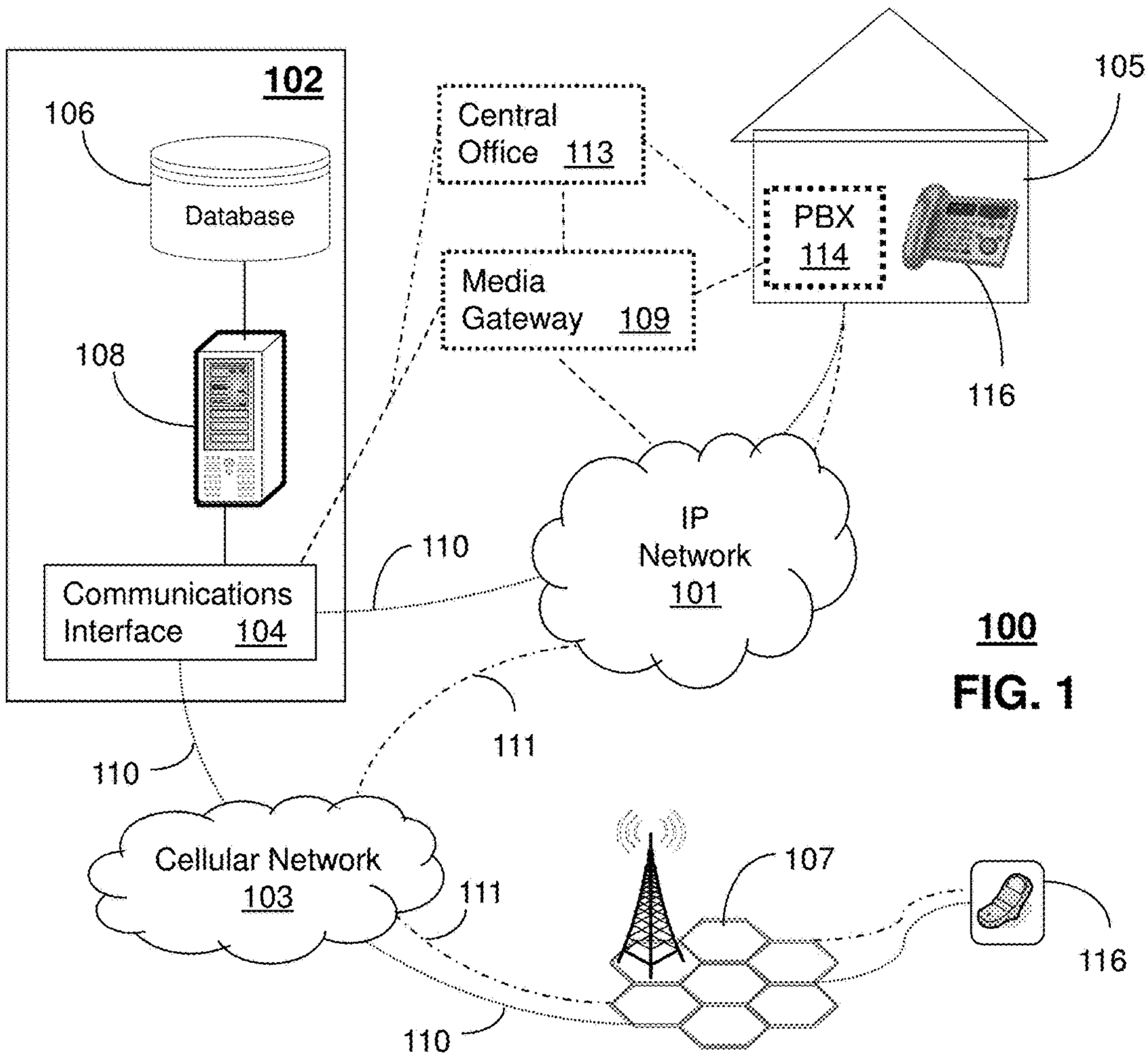
U.S. PATENT DOCUMENTS

6,847,632	B1	1/2005	Lee et al.	
6,853,718	B1	2/2005	Bedingfield et al.	
6,914,900	B1	7/2005	Komatsu et al.	
6,914,964	B1	7/2005	Levine	
6,976,055	B1 *	12/2005	Shaffer	H04L 29/06027 348/14.09
6,977,898	B1	12/2005	Miriyala et al.	
6,977,923	B1	12/2005	Hägebarth et al.	
7,006,618	B1	2/2006	Shaffer et al.	
7,023,979	B1	4/2006	Wu et al.	
7,065,199	B1	6/2006	Hyllander et al.	
7,088,816	B2	8/2006	Donnelly et al.	
7,106,848	B1	9/2006	Barlow et al.	
7,328,281	B2	2/2008	Takeda et al.	
7,403,744	B2	7/2008	Bridgelall	
7,729,489	B2 *	6/2010	Lee	H04M 3/42263 379/201.1
7,817,606	B2	10/2010	Lin	
8,181,226	B2	5/2012	Lohr et al.	
8,615,223	B2 *	12/2013	Rasanen	H04W 28/18 455/418
2002/0093948	A1 *	7/2002	Dertz	H04L 29/06027 370/355
2002/0150091	A1 *	10/2002	Lopponen	H04L 12/1818 370/389
2002/0194331	A1 *	12/2002	Lewis	G06Q 20/10 709/224
2004/0048612	A1 *	3/2004	Virtanen	H04W 76/20 455/426.1
2004/0133627	A1 *	7/2004	Kalyanaraman	H04L 29/06027 709/201
2004/0205191	A1	10/2004	Smith et al.	
2005/0054335	A1	3/2005	Pearson et al.	
2005/0114646	A1	5/2005	Rekimoto et al.	
2005/0154774	A1	7/2005	Giaffreda et al.	
2005/0202810	A1	9/2005	LaPallo et al.	
2005/0253716	A1	11/2005	Hayashi et al.	
2005/0285740	A1	12/2005	Kubach et al.	
2005/0286500	A1 *	12/2005	Minami	H04L 29/06027 370/352
2006/0092970	A1 *	5/2006	Song	H04L 29/06027 370/466
2006/0121891	A1	6/2006	Jagadeesan et al.	
2006/0153198	A1	7/2006	Chadha et al.	
2006/0294245	A1	12/2006	Raguparan et al.	
2007/0183401	A1 *	8/2007	Bennett	H04L 12/2834 370/352
2007/0186002	A1	8/2007	Campbell et al.	
2007/0213037	A1	9/2007	Lukacs	
2007/0263828	A1	11/2007	Lee et al.	
2007/0269037	A1	11/2007	Gardiner et al.	
2007/0297391	A1 *	12/2007	Furukawa	H04L 29/06 370/352
2009/0023399	A1 *	1/2009	Lindgren	H04L 63/0281 455/90.2
2009/0129359	A1 *	5/2009	Lee	H04W 36/14 370/342
2009/0310495	A1	12/2009	Seta	
2017/0078407	A1	3/2017	Schneider	
2017/0332219	A1	11/2017	Schneider	

OTHER PUBLICATIONS

Wang, et al., "A Signaling System Using Lightweight Call Sessions", Infocom 2000. 10th annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. IEEE Tel Aviv, Israel Mar. 26-30, 2000, Mar. 26, 2000, 697-706.

* cited by examiner



100

FIG. 1

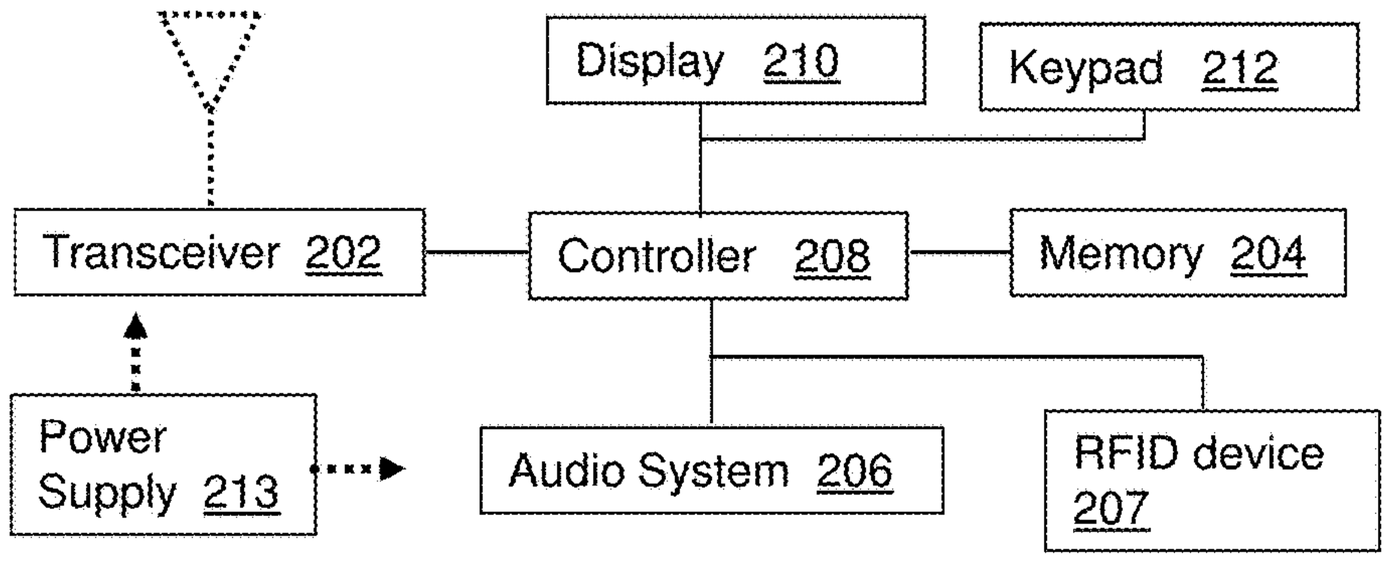


FIG. 2 116

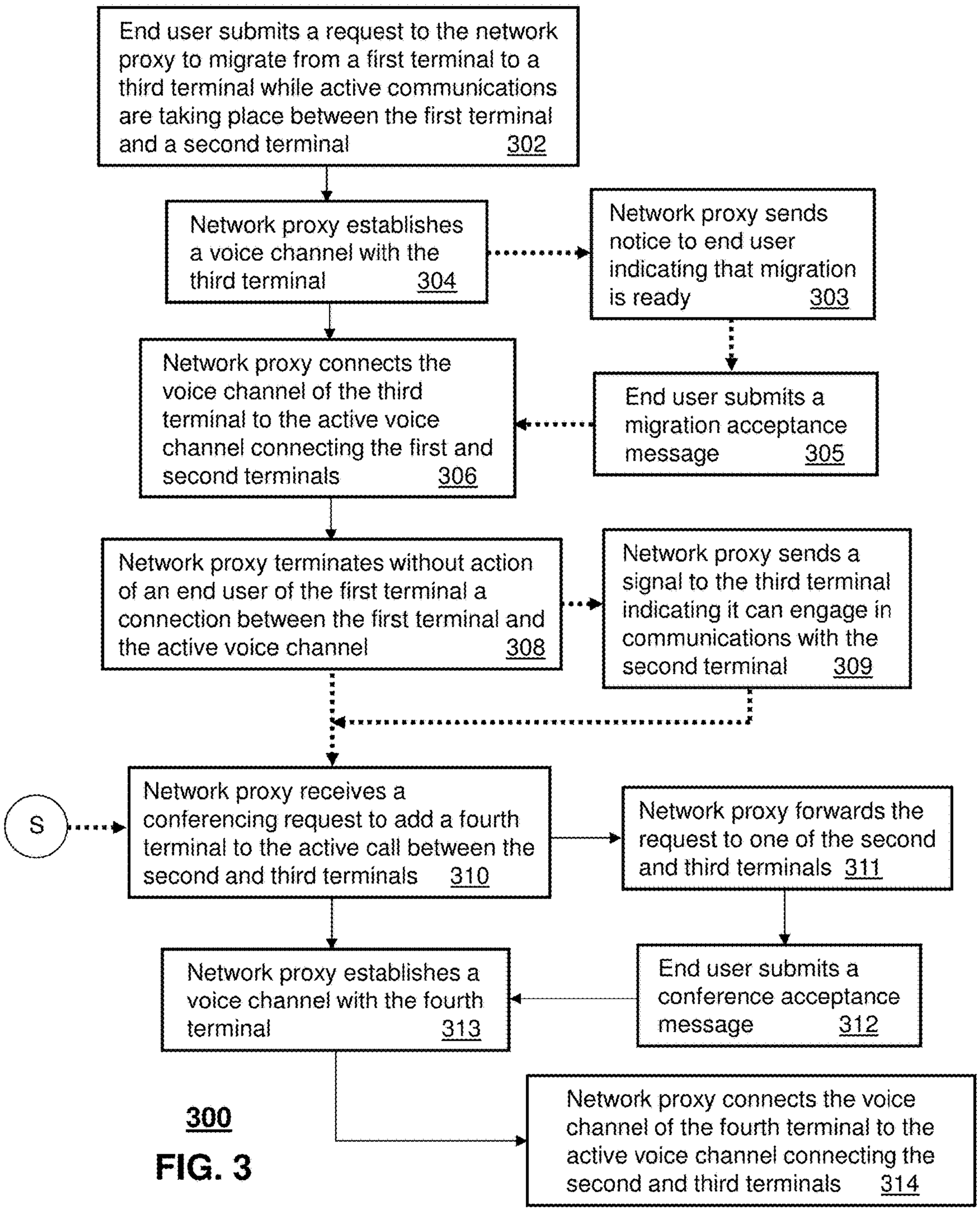

End user submits a request to the network proxy to migrate from a first terminal to a third terminal while active communications are taking place between the first terminal and a second terminal 302
Network proxy establishes a voice channel with the third terminal 304
Network proxy sends notice to end user indicating that migration is ready 303
End user submits a migration acceptance message 305
Network proxy connects the voice channel of the third terminal to the active voice channel connecting the first and second terminals 306
Network proxy terminates without action of an end user of the first terminal a connection between the first terminal and the active voice channel 308
Network proxy sends a signal to the third terminal indicating it can engage in communications with the second terminal 309
S
Network proxy receives a conferencing request to add a fourth terminal to the active call between the second and third terminals 310
Network proxy forwards the request to one of the second and third terminals 311
Network proxy establishes a voice channel with the fourth terminal 313
End user submits a conference acceptance message 312
Network proxy connects the voice channel of the fourth terminal to the active voice channel connecting the second and third terminals 314
300

FIG. 3

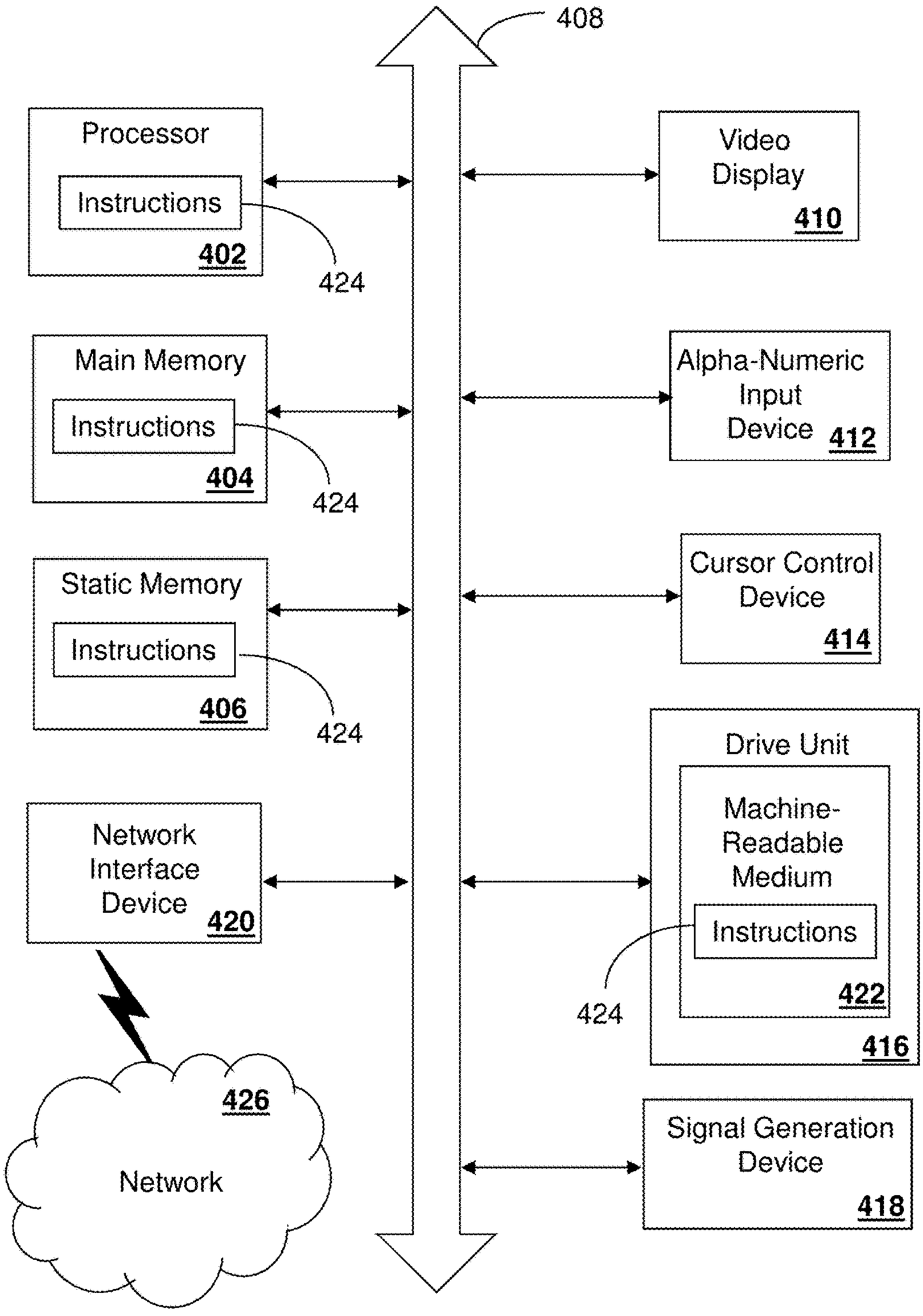

408
Processor
Instructions
402
424
Main Memory
Instructions
404
424
Static Memory
Instructions
406
424
Network Interface Device
420
426
Network
Video Display
410
Alpha-Numeric Input Device
412
Cursor Control Device
414
Drive Unit
Machine-Readable Medium
Instructions
422
424
416
Signal Generation Device
418

FIG. 4 400

METHOD AND APPARATUS FOR MIGRATING ACTIVE COMMUNICATION SESSION BETWEEN TERMINALS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 15/666,029, filed Aug. 1, 2017, which is a continuation of U.S. application Ser. No. 15/358,194, filed Nov. 22, 2016, now issued U.S. Pat. No. 9,756,137, which is a continuation of U.S. application Ser. No. 11/420,181, filed May 24, 2006, now issued U.S. Pat. No. 9,537,704, which are incorporated herein by reference in their entirety.

FIELD OF THE DISCLOSURE

The present disclosure relates generally to communication techniques, and more specifically to a method and apparatus for migrating between terminals.

BACKGROUND

Many consumers today have the choice of wired and wireless communication services. While in transit wireless communication services tends to be the preferred choice. While for those situated in a residence or commercial enterprise, wired communication services can be less expensive and generally offers better voice quality and/or data transmission throughput.

Transitioning between services during an active communication session can be awkward. For instance, in order for an end user to transition from a landline phone to a cell phone, the user needs to hang up the landline phone and originate a call on his cell phone with the same party. The same is true of the end user entering his residence while communicating on his cell phone and desiring to migrate to a landline phone.

A need therefore arises for a method and apparatus to migrate between terminals.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** depicts an exemplary embodiment of terminal devices communicating by way of wired and wireless access points (WAPs) with other terminal devices and/or a network proxy which collectively operate in a communication system;

FIG. **2** depicts exemplary embodiments of the terminal device;

FIG. **3** depicts an exemplary method operating in portions of the communication system; and

FIG. **4** depicts an exemplary diagrammatic representation of a machine in the form of a computer system within which a set of instructions, when executed, may cause the machine to perform any one or more of the methodologies disclosed herein.

DETAILED DESCRIPTION OF THE DRAWINGS

Embodiments in accordance with the present disclosure provide a method and apparatus for migrating between terminals.

In a first embodiment of the present disclosure, a network proxy can have a controller that manages a communications interface in a communication system. The controller can be programmed to receive a request to migrate a first terminal

to a third terminal while active communications are taking place on a first voice channel connecting the first terminal to a second terminal, establish a second voice channel with the third terminal, connect the first and second voice channels, and terminate without action of an end user of the first terminal a connection between the first terminal and the first voice channel.

In a second embodiment of the present disclosure, a computer-readable storage medium in a network proxy can have computer instructions for migrating a first terminal, engaged in active communications over a first voice channel with a second terminal, to a third terminal by connecting the third terminal to the first voice channel and automatically terminating a connection between the first terminal and the first voice channel.

In a third embodiment of the present disclosure, a computer-readable storage medium in a first terminal can have computer instructions for transmitting to a network proxy a request to migrate the first terminal, engaged in active communications over a first voice channel with a second terminal, to a third terminal by connecting the third terminal to the first voice channel and automatically terminating a connection between the first terminal and the first voice channel upon completing the connection with the third terminal.

FIG. **1** depicts an exemplary embodiment of terminal devices **116** communicating by way of wired and wireless access points (WAPs) with other terminal devices and/or a network proxy **102** which collectively operate in a communication system **100**. The communication system **100** comprises an IP (Internet Protocol) network **101** coupled to the network proxy **102**, a cellular network **103** and network elements located in a building **105** representing an enterprise or residence. The IP network **101** utilizes technology for transporting Internet traffic. For an enterprise setting, the building **105** can include a PBX **114** that provides voice and/or video connectivity services between terminal devices **116** of enterprise personnel such as a POTS (Plain Old Telephone Service) phone terminal, a Voice over IP (VoIP) phone terminal, or video phone terminal.

Similarly, in a residential setting, the building **105** can include POTS, VoIP or video terminal phone terminals coupled to a central office **113** utilizing conventional telephonic switches for processing calls with third parties. The network proxy **102** can be used to control operations of a media gateway **109**, the central office **113** and the PBX **114**. Communications between the network proxy **102**, terminal devices **116** and other network elements of the communication system **100** can conform to any number of signaling protocols such as signaling system 7 (SS7), session initiation protocol (SIP), or H.323.

The network proxy **102** can comprise a communications interface **104** that utilizes common technology for communicating over an IP interface with the IP network **101**, the media gateway **109**, or the cellular network **103**. By way of the communications interface **104**, the network proxy **102** can direct by common means any of the foregoing network elements to establish circuit switched and/or packet switched connections between terminals **116** distributed throughout the communication system **100**. The network proxy **102** further comprises a memory **106** (such as a high capacity storage medium) embodied in this illustration as a database, and a controller **108** that makes use of computing technology such as a desktop computer, or scalable server for controlling operations of the network proxy **102**. The network proxy **102** can operate as an IP Multimedia Sub-

system (IMS) conforming in part to protocols defined by standards bodies such as 3GPP (Third Generation Partnership Protocol).

Under the control of the network proxy **102**, the media gateway **109** can link packet-switched and circuit-switched technologies such as the cellular network **103** (or central office **113**) and the IP network **101**, respectively. The media gateway **109** can conform to a proprietary media gateway control protocol (MGCP) or an open standard such as H.248 defined in the Internet Engineering Task Force (IETF). This protocol can handle signaling and session management needed during a multimedia conference. The protocol defines a means of communication between the media gateway **109**, which converts data from the format required for a circuit-switched network to that required for a packet-switched network. MGCP can therefore be used to set up, maintain, and terminate calls between multiple disparate network elements of the communication system **100**. The media gateway **109** to support hybrid communication environments such as VoIP to POTS and vice-versa.

The cellular network **103** can support voice and data services such as GSM-GPRS, EDGE, CDMA-1×, UMTS, and other known technologies. The cellular network **103** is coupled to base stations **107** under a frequency-reuse environment for communicating over-the-air with roaming terminal devices **116**.

FIG. **2** depicts exemplary embodiments of the terminal device **116**. In one embodiment, the terminal device **116** can be embodied in an immobile device (e.g., a wireline phone such as a POTS, VoIP or video terminal). In another embodiment, the terminal device **116** can include short range communications technology (e.g., a cordless phone, Bluetooth or WiFi) to support mobility within a small area such as the end user's residence. Alternatively, the terminal device **116** can represent a mobile terminal device utilizing a wireless transceiver **202** that supports long-range wireless communications such as supported by the cellular network **103**. The wireless transceiver **202** of terminal device **116** utilizes technology for exchanging voice and data messages with the base stations **107**, which in turn relays said messages to targeted end user terminals **116**. In a multimode embodiment, the terminal device **116** can utilize a transceiver **202** that supports the aforementioned wireless and wireline access technologies (e.g., POTS, WiFi, Bluetooth™, cordless, and cellular).

Each of these embodiments of the terminal device **116** can further utilize a memory **204**, an audio system **206**, a radio frequency identification (RFID) device **207**, and a controller **208**. The memory **204** can comprise storage devices such as RAM, SRAM, DRAM, and/or Flash memories. The memory **204** can be an integral part of the controller **208**. The audio system **206** can comprise a low volume speaker for listening to messages near the end user's ear and an associated microphone for exchanging messages with calling parties. The audio system **206** can further utilize a loud speaker for listening to announcements at a distance substantially away from the end user's ear, and as a speakerphone feature. The RFID device **207** can represent a passive or active RFID for short-range communications that serve the purpose of identifying the presence of another terminal having a similar device and conveying to said terminal its presence and identification.

The controller **208** can manage the foregoing components with computing technology such as a microprocessor and/or digital signal processor. The terminal devices **116** can further include a display **210** for conveying images to the end user, a keypad **212** for manipulating operations of the communication device, and a portable power supply **213**. The audio system **206**, display **210**, and the keypad **212** can singly or in combination represent a user interface (UI) for interfacing with the end user.

FIG. **3** depicts an exemplary method **300** operating in portions of the communication system **100**. Method **300** begins with step **302** in which an end user submits a request to the network proxy **102** to migrate from a first terminal (e.g., a cell phone) to a third terminal (e.g., a landline phone) while active communications (e.g., a VoIP or circuit switch voice call) is taking place between the first terminal and second terminal. The request can be submitted to the network proxy **102** any number of ways.

For example, the end user can browse a website associated with the network proxy **102** by way of the first or third terminal **116** or some other computing device. At this website, the end user can request a migration between the aforementioned first and third terminals by selecting options in a UI presented by said website. In response to selecting a migration request, an Internet server supporting the website generates an Internet message corresponding to the request and transmits said message to the network proxy **102**. Alternatively, the website can be integrally managed by the network proxy **102** in which case it can take direct action on the request without a message transmission step.

Alternatively, the end user can send the migration request to the network proxy **102** as an over-the-air message (e.g., a short message service (SMS) message) utilizing common functions of the first or third terminal **116**. In yet another embodiment, the end user can depress one or more keys on the first or third terminal thereby submitting a sequence of Dual Tone Multi Frequency (DTMF) signals to the network proxy **102** which can represent the request (e.g., *8 to request a migration from cell phone to landline, or landline to cell phone depending on which terminal the network proxy **102** detects is submitting the request). The network proxy **102** can be programmed with any DTMF code to engage any number of desired migrations (cell phone to home, cell phone to office, cell phone to computer, home to cell phone, office to cell phone, computer to cell phone, and so on). In yet another embodiment, the end user of the first terminal **116** can interact with an interactive voice response system (IVR) managed or integrated into the network proxy **102** to specify by way of DTMF and/or voice signals a desired migration.

In yet another embodiment, the first and third terminals **116** can include a wireless transmitter in one terminal and a wireless receiver in the other (such as an RFID transmitter and RFID receiver) providing the terminal with the receiver a means to detect a presence of the other terminal. When such detection occurs, the receiving terminal **116** can automatically transmit the migration request to the network proxy **102** over a SS7, SIP or H.323 protocol. For example, in the case where the first terminal **116** is a cell phone, it can have a receiver to detect a signal transmitted by the third terminal (a landline).

In another embodiment, each of the first and third terminals **116** can include the RFID devices **207** mentioned earlier for mutual detection and identification. The first and third terminals **116** can decide amongst themselves which should send the migration request, or one of said terminals can be programmed to be the one that always submits said request. In yet another embodiment, the first or second terminal **116** can provide its end user a notice such as by way of a user interface (UI) presented at the display **210** informing said user of its detection of the other terminal. The UI can further

include a prompt suggesting a migration between terminals by way of selection buttons (e.g., "Accept" or "Reject").

It would be evident to an artisan with ordinary skill in the art from the aforementioned examples that there innumerable embodiments for submitting a request to the network proxy **102**.

Upon receiving the request from step **302**, the network proxy **102** can be programmed in step **304** to direct one or more network elements (e.g., the media gateway **109**, the central office **113**, the PBX **114**, the IP network **101**, and/or the cellular network **103**) of the communication system **100** to establish a voice channel with the third terminal. This step can represent the initiation of a network origination call to the third terminal **116** in which the end user hears a ringing alert at the third terminal prompting the end user to activate the terminal by removing it from its base or selecting a call acceptance button (e.g., a "Talk" button). Alternatively, if the request submitted to the network proxy **102** originated at the third terminal **116** by way of, for example, a DTNIF signal (e.g. *8) initiated by the end user, the network proxy **102** can be programmed in step **304** to direct the communication system **100** to establish a voice channel with the third terminal without all the steps required in a network origination call.

In step **306**, the network proxy **102** can be programmed to connect or bridge the voice channel of the third terminal **116** to the active voice channel connecting the first and second terminals **116**. The network proxy **102** can be programmed in step **308** to contemporaneously terminate without action of the end user of the first terminal **116** a connection between the first terminal and the active voice channel resulting in a voice channel connection between the second and third terminals **116** only. At this point, the migration from the first terminal **116** to the third terminal without requiring either party to terminate the active voice channel and initiate a network origination call from the third terminal to the second terminal (or vice-versa) as is required by prior art systems today.

In an alternative embodiment, the network proxy **102** can be programmed in step **303** to send a notice to the end user requesting the migration at either the first or third terminal **116** indicating the migration step is ready to be executed. The end user can then decide to reject, or accept the migration by submitting a migration acceptance message by way of DTMF signals or an IVR interaction in step **305**. Once accepted, the network proxy **102** can proceed with steps **306-308** as previously described. In another embodiment, the network proxy **102** can be programmed in step **309** to transmit a completion signal to the third terminal **116** indicating to an end user of said terminal that s/he can engage in communications with the second terminal. The completion signal can be an audible signal such as a double beep conveyed by the audio system **206**, a text signal presentable on the display **210**, or some other form of notification technique suitable to the present disclosure. Without step **309**, the end user of the third terminal **116** can assume this transition has occurred by attempting communications with the end user of the second terminal **116** and detecting a response.

In yet another embodiment, the network proxy **102** can be programmed in step **310** to receive a conferencing request from one of the end users of the second or third terminal **116**, or from a third party requesting by way of a fourth terminal to be added to the active call between the second and third terminals. Alternatively, the third party's request can be directed in step **311** to one among the end users of the second or third terminal **116** by way of a call waiting function. The targeted end user can in turn reject or accept the call for conferencing purposes. If accepted, the terminal **116** of the targeted end user can be programmed in step **312** to submit the request to network proxy **102** to add the fourth terminal to the active call.

Step **310** accordingly does not represent a request for migration, but rather a request to conference third parties. Upon receiving the conferencing request, the network proxy **102** in steps **313-314** directs the communication system **100** to establish a voice channel with the fourth terminal and connects said voice channel to the active channel between the second and third terminals. Like in step **304**, step **313** can represent a network origination call to the fourth terminal or a voice channel connection to the fourth terminal if it is actively engaged by the end user of said terminal. s

It would be apparent to an artisan with ordinary skill in the art that the aforementioned embodiments can be modified, reduced, or enhanced without departing from the scope and spirit of the claims described below. For example, method **300** can be modified to perform migration and third party conferencing functions described above for data communications without a voice function. The symbol (S) connecting to step **310** can denote an embodiment in which steps **310-312** can be performed by the network proxy **102** and terminal devices **116** independent of the migration steps **302-308**, thereby providing a means for inclusion of third parties for conferencing purposes. These are but a few examples of modifications that can be applied to the present disclosure. The reader is therefore directed to the claims below for a fuller understanding of the breadth and scope of the present disclosure.

FIG. **4** depicts an exemplary diagrammatic representation of a machine in the form of a computer system **400** within which a set of instructions, when executed, may cause the machine to perform any one or more of the methodologies discussed above. In some embodiments, the machine operates as a standalone device. In some embodiments, the machine may be connected (e.g., using a network) to other machines. In a networked deployment, the machine may operate in the capacity of a server or a client user machine in server-client user network environment, or as a peer machine in a peer-to-peer (or distributed) network environment.

The machine may comprise a server computer, a client user computer, a personal computer (PC), a tablet PC, a laptop computer, a desktop computer, a control system, a network router, switch or bridge, or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. It will be understood that a device of the present disclosure includes broadly any electronic device that provides voice, video or data communication. Further, while a single machine is illustrated, the term "machine" shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methodologies discussed herein.

The computer system **400** may include a processor **402** (e.g., a central processing unit (CPU), a graphics processing unit (GPU, or both), a main memory **404** and a static memory **406**, which communicate with each other via a bus **408**. The computer system **400** may further include a video display unit **410** (e.g., a liquid crystal display (LCD), a flat panel, a solid state display, or a cathode ray tube (CRT)). The computer system **400** may include an input device **412** (e.g., a keyboard), a cursor control device **414** (e.g., a mouse), a

disk drive unit **416**, a signal generation device **418** (e.g., a speaker or remote control) and a network interface device **420**.

The disk drive unit **416** may include a machine-readable medium **422** on which is stored one or more sets of instructions (e.g., software **424**) embodying any one or more of the methodologies or functions described herein, including those methods illustrated above. The instructions **424** may also reside, completely or at least partially, within the main memory **404**, the static memory **406**, and/or within the processor **402** during execution thereof by the computer system **400**. The main memory **404** and the processor **402** also may constitute machine-readable media.

Dedicated hardware implementations including, but not limited to, application specific integrated circuits, programmable logic arrays and other hardware devices can likewise be constructed to implement the methods described herein. Applications that may include the apparatus and systems of various embodiments broadly include a variety of electronic and computer systems. Some embodiments implement functions in two or more specific interconnected hardware modules or devices with related control and data signals communicated between and through the modules, or as portions of an application-specific integrated circuit. Thus, the example system is applicable to software, firmware, and hardware implementations.

In accordance with various embodiments of the present disclosure, the methods described herein are intended for operation as software programs running on a computer processor. Furthermore, software implementations can include, but not limited to, distributed processing or component/object distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

The present disclosure contemplates a machine readable medium containing instructions **424**, or that which receives and executes instructions **424** from a propagated signal so that a device connected to a network environment **426** can send or receive voice, video or data, and to communicate over the network **426** using the instructions **424**. The instructions **424** may further be transmitted or received over a network **426** via the network interface device **420**.

While the machine-readable medium **422** is shown in an example embodiment to be a single medium, the term "machine-readable medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store the one or more sets of instructions. The term "machine-readable medium" shall also be taken to include any medium that is capable of storing, encoding or carrying a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methodologies of the present disclosure.

The term "machine-readable medium" shall accordingly be taken to include, but not be limited to: solid-state memories such as a memory card or other package that houses one or more read-only (non-volatile) memories, random access memories, or other re-writable (volatile) memories; and/or magneto-optical or optical medium such as a disk or tape. Accordingly, the disclosure is considered to include any one or more of a machine-readable medium as listed herein and including art-recognized equivalents and successor media, in which the software implementations herein are stored.

Although the present specification describes components and functions implemented in the embodiments with reference to particular standards and protocols, the disclosure is not limited to such standards and protocols. Each of the standards for Internet and other packet switched network transmission (e.g., TCP/IP, UDP/IP, HTML, HTTP) represent examples of the state of the art. Such standards are periodically superseded by faster or more efficient equivalents having essentially the same functions. Accordingly, replacement standards and protocols having the same functions are considered equivalents.

The illustrations of embodiments described herein are intended to provide a general understanding of the structure of various embodiments, and they are not intended to serve as a complete description of all the elements and features of apparatus and systems that might make use of the structures described herein. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. Other embodiments may be utilized and derived therefrom, such that structural and logical substitutions and changes may be made without departing from the scope of this disclosure. Figures are also merely representational and may not be drawn to scale. Certain proportions thereof may be exaggerated, while others may be minimized. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

Although specific embodiments have been illustrated and described herein, it should be appreciated that any arrangement calculated to achieve the same purpose may be substituted for the specific embodiments shown. This disclosure is intended to cover any and all adaptations or variations of various embodiments. Combinations of the above embodiments, and other embodiments not specifically described herein, will be apparent to those of skill in the art upon reviewing the above description.

The Abstract of the Disclosure is provided to comply with 47 C.F.R. § 1.72(b), requiring an abstract that will allow the reader to quickly ascertain the nature of the technical disclosure. It is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. In addition, in the foregoing Detailed Description, it can be seen that various features are grouped together in a single embodiment for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiments require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter lies in less than all features of a single disclosed embodiment. Thus the following claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separately claimed subject matter.

What is claimed is:

1. A method comprising:

responsive to receiving a request, during an active communication session between a first end user device and a second end user device by a first connection to a first channel, to migrate the active communication session from the first end user device to a third end user device:

facilitating, by a processing system including a processor, a network origination call to the third end user device via a second channel; and

facilitating, by the processing system, a second connection of the first channel and the second channel by way of a communications bridge to maintain the active communication session;

contemporaneously and responsive to initiation of the network origination call, terminating, by the processing system, the first connection between the first end user device and the first channel; and

transmitting, by the processing system, a notification to the third end user device indicating that the third end user device can engage in communications with the second end user device.

2. The method of claim **1**, wherein the terminating of the first connection between the first end user device and the first channel is performed contemporaneous with a detection at the third end user device of an acceptance of the network origination call.

3. The method of claim **1**, wherein the terminating of the first connection between the first end user device and the first channel releases the first channel.

4. The method of claim **1**, wherein the request is transmitted by the first end user device responsive to a detection of the third end user device by the first end user device.

5. The method of claim **1**, wherein the first end user device obtains an identifier of the third end user device via short-range communications via a radio frequency identification device.

6. The method of claim **1**, wherein the request includes an identifier of the third end user device.

7. The method of claim **1**, wherein the first channel comprises a voice channel.

8. The method of claim **1**, further comprising:

receiving, by the processing system, a conferencing request transmitted from a fourth end user device to connect the fourth end user device to the second end user device and the third end user device; and

facilitating, by the processing system, a third connection of a third channel and the fourth end user device.

9. The method of claim **8**, further comprising facilitating, by the processing system, a fourth connection of the second channel and the third channel, wherein the fourth connection of the second channel and the third channel is facilitated during the active communications session.

10. The method of claim **1**, further comprising transmitting, by the processing system, a signal to the third end user device indicating that the active communication session with the second end user device is available to the third end user device.

11. The method of claim **10**, wherein the signal comprises an audible signal, a text signal, or any combination thereof.

12. The method of claim **1**, further comprising providing, by the processing system, a notice to a user of the first channel regarding detection of one of the first end user device by the third end user device or the third end user device by the first end user device.

13. An end user device, comprising:

a processing system including a processor; and

a memory that stores executable instructions that, when executed by the processing system, facilitate performance of operations, comprising:

facilitating a first connection to a first channel to enable an active communication session with a second end user device via the first channel;

sending a request to a server to migrate the active communication session with the second end user device to a third end user device, wherein the server facilitates a network origination call to the third end user device via a second channel, and wherein the server facilitates a second connection of the first channel and the second channel by way of a communications bridge when the network origination call is answered by the third end user device to maintain the active communication session; and

facilitating termination of the first connection between the end user device and the first channel contemporaneously and responsive to initiation of the network origination call.

14. The end user device of claim **13**, wherein the first connection between the end user device and the first channel is automatically terminated contemporaneous with a detection at the third end user device of an acceptance of the network origination call.

15. The end user device of claim **13**, wherein the operations further comprise receiving an identifier of the third end user device via short-range communications via a radio frequency identification device.

16. The end user device of claim **13**, wherein the operations further comprise detecting the third end use device, wherein the sending of the request to the server to migrate the active communication session is responsive to the detecting of the third end user device.

17. The end user device of claim **13**, wherein the first channel comprises a first voice channel, and wherein the second channel comprises a second voice channel.

18. A machine-readable storage medium, comprising executable instructions that, when executed by a processing system including a processor, facilitate performance of operations, comprising:

responsive to receiving a request to conference a third end user device into an active communication session between a first end user device and a second end user device over a first connection to a first channel, initiating a network origination call to the third end user device via a second channel; and

facilitating a second connection of the first channel and the second channel by way of a communications bridge to complete the conference of the first end user device, the second end user device, and the third end user device.

19. The machine-readable storage medium of claim **18**, wherein the request is transmitted by the third end user device responsive to a detection, by the third end user device, of the first end user device, the second end user device, or any combination thereof.

20. The machine-readable storage medium of claim **18**, wherein the processing system comprises a plurality of processors operating in a distributed processing environment.

* * * * *